AF/2681 IFW

PTO/SB/21 (02-04)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/934,742
Filing Date	08/21/2001
First Named Inventor	IZADPANAH, et al.
Art Unit	2681
Examiner Name	Nguyen, Huy D.
Attorney Docket Number	HRL098

Total Number of Pages in This Submission

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
- [x] Fee Attached
- [x] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance communication to Technology Center (TC)
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) (please Identify below):

2 X APPENDIX

Remarks

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Firm or Individual name	CARY TOPE-MCKAY
Signature	
Date	10/28/2005

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PTO/SB/17 (10-04v2)
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FEE TRANSMITTAL for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	09/934,742
Filing Date	08/21/2001
First Named Inventor	IZADPANAH, et al.
Examiner Name	NGUYEN, HUY D.
Art Unit	2681
Attorney Docket No.	HRL098

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☑ Credit card ☐ Money Order ☐ Other ☐ None

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Deposit Account Number

Deposit Account Name

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below	Fee Paid
Total Claims		-20** =		X =
Independent Claims		- 3** =		X =
Multiple Dependent				=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	
1402	340	2402	170	Filing a brief in support of an appeal	500.00
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	685	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 500.00

SUBMITTED BY					
Name (Print/Type)	Cary Tope-McKay	Registration No. (Attorney/Agent)	41,350	Telephone	310-589-8158
Signature				Date	10/28/2005

(Complete *(if applicable)*)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants: Izadpanah et al.

Serial No.: 09/934,742

Filed: 8/21/2001

For: "Networked and field addressable distributed antenna system"

On Appeal to the Board of Appeals

Examiner: Nguyen, Huy D

Group Art Unit: 2681

Our Ref: HRL098

BRIEF ON APPEAL

Hon. Commissioner for Patents
Washington, D.C. 20231

Sir:

This is an appeal from the Final Rejection, dated April, 28, 2005, for the above-identified patent application.

REAL PARTY IN INTEREST

The present application has been assigned to HRL Laboratories, LLC of Malibu, CA.

RELATED APPEALS AND INFERENCES

There are no related appeals or interferences to this application.

STATUS OF CLAIMS

Claims 1-26 and 38-45 are the subject of this appeal. The Appellants disagree with the Examiner that Claims 1-3, 5-6, 9, and 38 – 41 are anticipated by the prior art. A copy of all claims of the application is contained in the attached Appendix A.

STATUS OF AMENDMENTS

No Amendment after Final Rejection has been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention described and claimed in the present application relates to a method and apparatus "for providing a networked and field addressable distributed antenna system for facilitating broadband wireless communications" (page 1, lines 6-8). "In general terms, the present invention provides a mechanism, technique, and method which uses networked and field addressable distributed antennas in order to provide broadband coverage in a megacell subdivided into a plurality of picocells. Secondary base repeater nodes are distributed throughout the megacell such that each secondary base repeater node can receive an information signal, which it can re-transmit in at least one of three directions. The information signal is transmitted on a broadband channel and propagates in a tree-like manner across the megacell. The direction(s) in which the information signal is transmitted from each secondary base repeater node is determined by a control signal transmitted from a control signal transmitter on a narrowband channel. In order to generate the control signal, a database is used, which stores control codes for switches that control the direction in which the information signal is transmitted from each secondary base repeater node. The control codes are used in order to guide an information signal along a desired path in the megacell so that it reaches a desired picocell." (page 10, line 22 – page 11, line 12).

In one embodiment, as claimed in Claim 1, a networked and field-addressable distributed antenna system comprises a large field megacell coverage area 100 (shown in FIG. 1), at least a portion of which is partitioned into a plurality of short range picocells 102, wherein each of the picocells 102 is serviced by a secondary base repeater node 300 (shown in FIG. 3) operative (via an antenna 302) to receive an information signal source, and to receive a command signal including a direction command from an originating base station 106 (shown in FIG. 1) having a command signal transmitter, and to transmit the information signal in at least one of three directions (see FIG. 3) for receipt by local users or by a neighboring secondary base repeater node positioned along the direction to which the information signal was transmitted, the direction in which the information signal is transmitted being determined by the direction command of the command signal (page 15,

lines 18-24), wherein the secondary base repeater nodes are positioned such that they re-broadcast the information signal to neighboring secondary base repeater nodes in a tree structure (page 13, lines 6 – 18).

In another embodiment, as claimed in Claim 2, the secondary base repeater nodes 300 (shown in FIG. 3) are positioned such that they re-broadcast the information signal in a fan-out tree structure. The fan-out tree structure is depicted in FIG. 2 and described on page 13, lines 6 – 18. Additionally, on page 10, lines 8-16, a tree structure is defined as a well-known geometric networking structure which begins at a root or origin and branches outward to terminate at leaf nodes. Each node in the tree structure preferably has three sub-branches (e.g., each secondary base repeater node services the following three picocells, each with a receiving secondary base repeater node for receiving the information signal transmitted across the respective picocell from an originating secondary base repeater node). Depending on the needs of the particular embodiment, the tree structure of the secondary base repeater nodes (and hence, the picocells) within a megacell may be balanced or non-balanced (e.g., may have the same number of sub-branches at each node.)

In another embodiment, as claimed in Claim 3, the megacell 204 (shown in FIG.2), has an input end 208 and an output end 212, and the information signal may be propagated from secondary base repeater node to secondary base repeater node from an information signal source 206 at the input end 208 to an information signal output end receiver 210 at the output end 212, with the information signal output end receiver 210 configured to receive from a plurality of base repeater nodes at the output end 212 of the megacell 204 (page 13, lines 4 – 12).

In another embodiment, as claimed in Claim 5, the information signal output end receiver 210 is connected with the information source 206 by a loop back means 214. This limitation is depicted in FIG. 2, and described on page 13, lines 12-14.

In another embodiment, as claimed in Claim 6, the loop back means 214 is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel. This limitation is described on page 13, lines 15 – 18.

In another embodiment, as claimed in Claim 9, the direction command from the command signal includes a direction command for a plurality of secondary base repeater

nodes in order to cause the secondary base repeater nodes to transmit the information signal along a predetermined path through the megacell. This limitation is described on page 14, lines 8 – 19.

In another embodiment, as claimed in Claim 38, a method for distributing information to selective picocells within a megacell by using a networked and field-addressable distributed antenna system comprises steps of: receiving an information signal 600 (shown in FIG. 6) from an information source at a secondary base repeater node; receiving a command signal 602 including a direction command from a command signal transmitter; determining at least one direction 604 in which to re-transmit the received information signal from the secondary base repeater node; and re-transmitting the received information signal 606 in at least one of three directions as determined in the determining step for receipt by local users or by a neighboring secondary base repeater node positioned in the direction to which the information signal may be re-broadcast through a plurality of secondary base repeater nodes in a tree structure. These limitations are found in FIG. 6 and further described on page 19, lines 10 – 23.

In another embodiment, as claimed in Claim 39, the method described in the paragraph above regarding Claim 38, further includes a step of configuring the base repeater nodes such that they re-broadcast the information signal in a fan-out tree structure. This limitation is described on page 20, lines 1 – 3.

In another embodiment, as claimed in Claim 40, the method described in the paragraph above regarding Claim 39, further includes a step of selectively positioning the base repeater nodes such that only desired picocells within the megacell are capable of receiving the information signal. This limitation is described on page 20, lines 4 – 5.

In another embodiment, as claimed in Claim 41, the megacell has an input end and an output end, and wherein the method described above regarding Claim 40, further comprises a step of looping back 610 the information signal from the output end to the input end. This limitation is shown in FIG. 6 and described on page 20, lines 6 – 8.

GROUNDS OF REJECTION TO BE REVIWED ON APPEAL

Issue 1 – Are Claims 1-3, 5-6, 9, and 38 - 41 patentable under 35 USC 102(e) over U.S. Patent No. 6,690,657, to Lau et al., ("the Lau Patent")?

THE ARGUMENT

***Issue 1** – Are Claims 1-3, 5-6, 9, and 38 - 41 patentable under 35 USC 102(e) over U.S. Patent No. 6,690,657, to Lau et al., ("the Lau Patent")?*

The ground of rejection to which the Appellants contest herein applies to more than one claim. Such additional claims, to the extent separately identified and argued below, do not stand or fall together.

Claim 1

In sections 2 and 3 of the Office Action dated April 28, 2005, the Examiner rejected Claims 1-3, 5-6, 9, and 38 - 41 under 35 USC §102(e) as being anticipated by US Patent No. 6,690,657 to Lau et al., herein referred to as "the Lau patent." In order to establish a prima facie case of anticipation, the Examiner must set forth an argument that provides (1) a single reference (2) that teaches or enables (3) each of the claimed elements (as arranged in the claim) (4) either expressly or inherently and (5) as interpreted by one of ordinary skill in the art. All of these factors must be present, or a case of anticipation is not met. Thus, "[a]nticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983).

The Appellants submit that the Lau patent does not teach, disclose, or suggest all of the limitations of Claim 1. Specifically, the Appellants assert that the Lau patent does not teach, disclose, or suggest "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." as is claimed in Claim 1.

a. The Examiner's Arguments.

In Section 3 of the Office Action, the Examiner rejected Claim 1, stating that the Lau patent "teaches a networked and field addressable distributed antenna system comprising a large field megacell coverage area, at least a portion of which is partitioned into a plurality of short range picocells, wherein each of the picocells is serviced by a

secondary base repeater node operative to receive an information signal from a neighboring secondary base repeater node or from an originating information signal source, and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transit the information signal in at least one of three directions for receipt by local users or by a neighboring secondary base repeater node positioned along the direction to which the information signal was transmitted, the direction in which the information signal is transmitted being determined by the direction command of the command signal, wherein the secondary base repeater nodes are positioned such that they re-broadcast the information signal to a neighboring secondary base repeater nodes in a tree structure." The Examiner points to col. 4, lines 6-52, col. 5, lines 31-67, col. 6, lines 1-52, col. 8, lines 50-67 and col. 9, lines 1-24 to support his assertion that the Lau patent teaches all of these limitations.

Further, in response to the Appellants' arguments filed December 6, 2004, the Examiner states, on page 2 of the Office Action, that the Lau patent teaches "a secondary base repeater node operative to receive information signal" in col. 5, lines 60-62, and FIGs. 6 and 7 (referring to repeaters 68 and 78). Additionally, the Examiner further states that the limitation of "receiv[ing] a command including a direction command from an originating base station, and [transmitting] the information signal in at least one of three directions" is taught in the Lau patent in col 6, lines 1-3 and col 9, lines 66-67.

b. The Appellants arguments.

The Appellants disagree with the conclusion drawn by the Examiner. Essentially, the Appellants submit that the Lau patent does not teach, disclose, or suggest all of the elements of Claim 1. Specifically, the Appellants assert that the Lau patent does not teach, disclose or suggest "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." as is claimed in Claim 1.

In the final Office Action, the Examiner stated that col. 5, lines 60-62 teach a secondary base repeater node operative to receive an information signal. The Appellants concede that the Lau patent teaches a node operative to receive an information signal and retransmit that signal on a different channel, as described in col. 5, lines 60-62 of the Lau patent; however, the Applicants assert that receiving a signal on one channel and retransmitting it on a second channel is not the same thing as "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." as is claimed in Claim 1.

In support of his claim that the Lau patent teaches the limitation of "receiv[ing] a command including a direction command from an originating base station, and [transmitting] the information signal in at least one of three directions" the Examiner points to col. 6, lines 1-3 of the Lau patent, which state "[o]ther possibilities include sensing the source and/or destination of the signal and performing an appropriate repetition." The Examiner also refers to col. 9, lines 64-67, which state "[c]ontrol circuit 206 may include additional sophistication, such as the ability to examine the data's source and/or destination and select a corresponding output channel." The Appellants disagree that these sections of the Lau patent, or the Lau patent as a whole teach, disclose or suggest "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." as is claimed in Claim 1.

The Lau patent, as described in col. 4, lines 6-27, teaches a robust network that can be extended beyond each transceiver's useful range through the use of low-power transceivers. These low-power transceivers are channel-shifting RF repeaters. "A typical installation of a system according to an embodiment of the invention will include multiple transmitters and receivers ... and multiple channel-shifting repeaters. A base

station controls the allocation of time on one or more available channels between competing transmitters, and may also control the function of the channel-shifting repeaters."

In addition, the Lau patent in col. 5, line 59 through col. 6, line 6 discusses one embodiment of the invention of the Lau patent. In the embodiment, shown by FIGS. 6 and 7, there are three non-interfering channels CH1, CH2 and CH3. "Repeaters 68 and 78 can receive signals on both CH1 and CH2, and have the capability to retransmit a signal received on CH1 on CH2, and a signal received on CH2 on CH3. ... In other embodiments, the repeaters can measure signal strength and decide for each signal, whether to repeat the CH1 signal on CH2, or to repeat a CH2 retransmission on CH3. Other possibilities include sensing the source and/or destination of the signal and performing an appropriate repetition." Thus, by reading the part of the Lau patent cited by the Examiner in context, one skilled in the art would understand that the Lau patent suggests that the retransmission decision, either CH1 on CH2 or CH2 on CH3 may be made depending upon the source and/or destination of the signal. The Applicants assert that this is not the same thing as "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." (emphasis added) as is claimed in Claim 1, since there is no hint in the Lau patent that the CH2 signal or the CH3 signal is limited in direction.

Further, the Appellants submit that col. 9, lines 64-67 cited by the Examiner are implementation details of how the Lau patent might choose an output channel CH2 or CH3 based upon the source and/or destination signal. Again, the Appellants submit that there is nothing in the portions of the Lau patent cited by the Examiner, or in the Lau patent as a whole, which suggests that the repeater can transmit output channels CH2 and CH3 in different directions.

Therefore, the Appellants submit that the Lau patent does not teach, disclose, or suggest "a secondary base repeater node operative to receive an information signal ... and to receive a command signal including a direction command from an originating base

station having a command signal transmitter, and to transmit the information signal in at least one of three directions ... the direction in which the information signal is transmitted being determined by the direction command signal ..." as is claimed in Claim 1. As such, the Appellants submit that Claim 1 is patentable over the cited prior art.

Claim 2

Claim 2, dependent on Claim 1, is patentable by virtue of its dependency.

Additionally, Claim 2 claims, in part, "the secondary base repeater nodes are positioned such that they re-broadcast the information signal in a fan-out tree structure."

On page 3 of the Office Action, the Examiner rejected Claim 2 stating "Lau et al. teaches the networked and field addressable distributed antenna system as set forth in claim 1, wherein the secondary base repeater nodes are positioned such that they rebroadcast the information signal in a fan-out tree structure." The Examiner pointed to col. 5, lines 31-38 and FIGs. 4 and 5 to support his conclusion. The Appellants disagree with the Examiner's interpretation of the Lau patent.

Col. 5, lines 31-38 of the Lau patent state "FIGS. 4 and 5 assume that two substantially non-interfering channels are available. Repeaters 68 and 78 have a single task to perform: they receive signals on a first channel (CH1) and retransmit these signals on a second channel (CH2). T/R module 62, 64, 70, 74, and 80 transmit on CH1 and receive on CH2. In a system with added complexity, the T/R modules can selectively receive on either CH1 or CH2." FIGs. 4 and 5 depict T/R modules and repeaters. However, the Appellants submit that neither the language in the Lau patent, or the figures teach "rebrodcasting the information signal in a fan-out tree structure," (emphasis added) as is claimed in Claim 2.

As stated in the MPEP section 211 "the pending claims must be 'given [their] broadest reasonable interpretation consistent with the specification," citing *In re Hyatt,* 211 F.3d 1367, 1372 (Fed. Cir. 2000). Page 10, lines 8-16 of the present specification, defines a tree structure as a well-known geometric networking structure which begins at a root or origin and branches outward to terminate at leaf nodes. Each node in the tree structure preferably has three sub-branches (e.g., each secondary base repeater node services the following three picocells, each with a receiving secondary base repeater node

for receiving the information signal transmitted across the respective picocell from an originating secondary base repeater node). Depending on the needs of the particular embodiment, the tree structure of the secondary base repeater nodes (and hence, the picocells) within a megacell may be balanced or non-balanced (e.g., may have the same number of sub-branches at each node). The Appellants submit that the Lau patent does not teach, disclose or suggest "rebroadcasting the information signal in a fan-out tree structure," as is claimed in Claim 2, when Claim 2 is interpreted in a manner consistent with the specification. Thus, the Appellants submit that Claim 2 is patentable over the cited prior art.

Claim 3

Claim 3, dependent on Claim 2, is patentable by virtue of its dependency.

Claim 4

Claim 4, dependent on Claim 3, is patentable by virtue of its dependency. Further, the Examiner indicted on page 5 of the Office Action that Claim 4 contained allowable subject matter.

Claim 5

Claim 5, dependent on Claim 3, is patentable by virtue of its dependency.

On page 4 of the Office Action, the Examiner rejected Claim 5 stating "Lau et al. teaches the networked field addressable distributed antenna system as set forth in Claim 3, wherein the information signal output end receiver is connected with the information source by a loop back means." The Examiner pointed to FIGs. 5 and 7, col. 5, lines 31-67, and col. 6, lines 1-52 of the Lau patent to support his position. The Appellants disagree with the Examiner's interpretation of the Lau patent.

The Appellants are unclear how the Examiner is interpreting the cited sections of the Lau patent and the cited figures, since the Examiner does not indicate what portion of the Lau patent the Examiner believes to be a "loop back means." The Appellants are unaware of anywhere in the Lau patent the concept of "loop back" is taught, disclosed, or suggested. The cited sections and figures of the Lau patent teach that two-way

communications can occur between T/R module 62 and any of the other T/R modules, col. 5, lines 53-55 of the Lau patent. However, two-way communications is not the same thing as "loop back." Appendix B contains a variety of different definitions for loop back that can be found on the Internet. Each definition contains the concept that for loop back, the same signal transmitted gets returned to the original transmitter. This is not the same thing as two-way communication, where one transmitter sends a first signal, and the second transmitter sends a second signal in response to the first signal. An example of two-way communication is a conversation, where one person asks "how are you?" and the other person answers "I'm fine." In a loop back situation, the response to "how are you?" from the first person would be "how are you?" from the second person. Thus the Appellants submit that the Lau patent does not teach, disclose, or suggest "wherein the information signal output end receiver is connected with the information source by a loop back means," as is claimed in Claim 5. Therefore, the Appellants submit that Claim 5 is patentable over the cited prior art.

Claim 6

Claim 6, dependent on Claim 5, is patentable by virtue of its dependency.

Additionally, on page 4 of the Office Action, the Examiner stated that col. 5, lines 47-57 of the Lau patent teaches "wherein the loop back means is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel." The Appellants disagree with the Examiner's interpretation of the Lau patent.

As previously discussed with respect to Claim 5, the Appellants submit that the Lau patent does not disclose, teach, or suggest a loop back means. Further, the Appellants submit that the Lau patent does not teach, disclose, or suggest that "the loop back means is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel."

Col. 5, lines 47-57 of the Lau patent state "FIG. 5 illustrate T/R module 80 transmitting on CH1. Repeater 78 and T/R module 74 pick up this signal, and repeater 78 retransmits it on CH2. Repeater 68 is in range to receive the retransmitted signal, but under these rules, performs no further retransmission. T/R module 62 is thus the only module that receives the retransmitted signal. Under these rules and this configuration,

two-way communications can occur between T/R module 62 and any of the other T/R modules. But certain combinations of T/R modules, like those that cannot communicate in FIG. 5, cannot communicate. If this is unacceptable, other embodiments are available to handle this situation." The Appellants note that no where in this section is a fiber-optic cable or a wire taught, disclosed, or suggested. Further, while the Lau patent does teach a wireless connection between the T/R modules and the repeaters, this is not the same thing as a loop back means. Therefore, the Appellants submit that the Lau patent does not teach, disclose, or suggest wherein the loop back means is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel," as is claimed in Claim 6. Therefore, the Appellants submit that Claim 6 is patentable over the cited prior art.

Claims 7-8

Claim 7, dependent on Claim 6, is patentable by virtue of its dependency. Claim 8, dependent upon claim 7, is patentable by virtue of its dependency.

Further, the Examiner indicted on page 5 of the Office Action that Claims 7 and 8 contained allowable subject matter.

Claim 9

Claim 9, dependent on Claim 1, is patentable by virtue of its dependency.

On pages 3 and 4 of the Office Action, the Examiner rejected Claim 9, stating that the Lau patent (in col. 8, lines 50-67 and col. 9, lines 1-24) teaches "the networked and field addressable distributed antenna system as set forth in Claim 1, wherein the direction command from the command signal includes a direction command for a plurality of secondary base repeater nodes in order to cause the secondary base repeater nodes to transmit the information signal along a predetermined path through the megacell." The Appellants respectfully disagree with the conclusion drawn by the Examiner.

As stated above, in reference to Claim 1, the Appellants submit that the Lau patent does not teach, disclose or suggest "the direction command from the command signal." Further, the Appellants submit that the Lau patent does not teach, disclose or suggest that the secondary base repeater nodes "transmit the information signal along a

predetermined path through the megacell," as is claimed in Claim 9. The Appellants submit that the Lau patent teaches transmitting information at predetermined frequencies (i.e., channels), but not along a predetermined path. Thus, the Appellants submit that the Lau patent does not teach, disclose or suggest "the direction command from the command signal includes a direction command for a plurality of secondary base repeater nodes in order to cause the secondary base repeater nodes to transmit the information signal along a predetermined path through the megacell," as is claimed in Claim 9. Therefore, the Appellants submit that Claim 9 is patentable over the cited prior art.

Claims 10-26

Claims 10-26 are patentable at least based on their dependency. Further, on page 5 of the Office Action, the Examiner stated that Claims 10-26 contained allowable subject matter.

Claim 38

On pages 2 and 3 of the Office Action, the Examiner rejected Claim 38 for the same reasons he rejected Claim 1. The Appellants assert that the Lau patent does not teach, disclose, or suggest all of the elements of Claim 38. Essentially, the Appellants submit that the Lau patent does not teach, disclose, or suggest all of the elements of Claim 1. Specifically, the Appellants assert that the Lau patent does not teach, disclose or suggest "receiving a command signal including a direction command from a command signal transmitter; determining at least one direction in which to re-transmit the received information signal from the secondary base repeater nodes; and re-transmitting the received information signal in at least one of three directions ... whereby the information signal may be re-broadcast through a plurality of secondary base repeater nodes in a tree structure," as is claimed in Claim 38.

In the final Office Action, the Examiner stated that col. 5, lines 60-62 teach a secondary base repeater node operative to receive an information signal. The Appellants concede that the Lau patent teaches a node operative to receive an information signal and retransmit that signal on a different channel, as described in col. 5, lines 60-62 of the Lau patent; however, the Applicants assert that receiving a signal on one channel and

retransmitting it on a second channel is not the same thing as "receiving a command signal including a direction command from a command signal transmitter; determining at least one direction in which to re-transmit the received information signal from the secondary base repeater node; and re-transmitting the received information signal in at least one of three directions," as is claimed in Claim 38.

In support of his claim that the Lau patent teaches the limitation of "receiving a command including a direction command from a command signal transmitter, and re-transmitting the received information signal in at least one of three directions" the Examiner pointed to col. 6, lines 1-3 of the Lau patent, which state "[o]ther possibilities include sensing the source and/or destination of the signal and performing an appropriate repetition." The Examiner also refered to col. 9, lines 64-67, which state "[c]ontrol circuit 206 may include additional sophistication, such as the ability to examine the data's source and/or destination and select a corresponding output channel." The Appellants disagree that these sections of the Lau patent, or the Lau patent as a whole teach, disclose or suggest "receiving a command signal including a direction command from a command signal transmitter, and re-transmitting the received information signal in at least one of three directions," as is claimed in Claim 38.

The Lau patent, as described in col. 4, lines 6-27, teaches a robust network that can be extended beyond each transceiver's useful range through the use of low-power transceivers. These low-power transceivers are channel-shifting RF repeaters. "A typical installation of a system according to an embodiment of the invention will include multiple transmitters and receivers ... and multiple channel-shifting repeaters. A base station controls the allocation of time on one or more available channels between competing transmitters, and may also control the function of the channel-shifting repeaters."

In addition, the Lau patent in col. 5, line 59 through col. 6, line 6 discusses one embodiment of the invention of the Lau patent. In the embodiment, shown by FIGs. 6 and 7, there are three non-interfering channels CH1, CH2 and CH3. "Repeaters 68 and 78 can receive signals on both CH1 and CH2, and have the capability to retransmit a signal received on CH1 on CH2, and a signal received on CH2 on CH3. ... In other embodiments, the repeaters can measure signal strength and decide for each signal,

whether to repeat the CH1 signal on CH2, or to repeat a CH2 retransmission on CH3. Other possibilities include sensing the source and/or destination of the signal and performing an appropriate repetition." Thus, by reading the part of the Lau patent cited by the Examiner in context, one skilled in the art would understand that the Lau patent suggests that the retransmission decision, either CH1 on CH2 or CH2 on CH3 may be made depending upon the source and/or destination of the signal. The Applicants assert that this is not the same thing as "receiving a command signal including a direction command from a command signal transmitter, and re-transmitting the received information signal in at least one of three directions" (emphasis added) as is claimed in Claim 38, since there is no hint in the Lau patent that the CH2 signal or the CH3 signal is limited in direction.

Further, the Appellants submit that col. 9, lines 64-67 cited by the Examiner are implementation details of how the Lau patent might choose an output channel CH2 or CH3 based upon the source and/or destination signal. Again, the Appellants submit that there is nothing in the portions of the Lau patent cited by the Examiner, or in the Lau patent as a whole, which suggests that the repeater can transmit output channels CH2 and CH3 in different directions.

Therefore, the Appellants submit that the Lau patent does not teach, disclose, or suggest "receiving a command signal including a direction command from a command signal transmitter, and re-transmitting the information signal in at least one of three directions" as is claimed in Claim 38. As such, the Appellants submit that Claim 38 is patentable over the cited prior art.

Claim 39

Claim 38, dependent on Claim 39, is patentable by virtue of its dependency.

Additionally, Claim 38 claims, in part, "configuring the base repeater nodes such that they re-broadcast the information signal in a fan-out tree structure."

On page 3 of the Office Action, the Examiner rejected Claim 39 stating "Lau et al. teaches the networked and field addressable distributed antenna system as set forth in claim 1, wherein the secondary base repeater nodes are positioned such that they rebroadcast the information signal in a fan-out tree structure." The Examiner pointed to

col. 5, lines 31-38 and FIGs. 4 and 5 to support his conclusion. The Appellants disagree with the Examiner's interpretation of the Lau patent.

Col. 5, lines 31-38 of the Lau patent state "FIGS. 4 and 5 assume that two substantially non-interfering channels are available. Repeaters 68 and 78 have a single task to perform: they receive signals on a first channel (CH1) and retransmit these signals on a second channel (CH2). T/R module 62, 64, 70, 74, and 80 transmit on CH1 and receive on CH2. In a system with added complexity, the T/R modules can selectively receive on either CH1 or CH2." FIGs. 4 and 5 depict T/R modules and repeaters. However, the Appellants submit that neither the language in the Lau patent, or the figures teach "re-brodcast[ing] the information signal in a fan-out tree structure," (emphasis added) as is claimed in Claim 39.

As stated in the MPEP section 211 "the pending claims must be 'given [their] broadest reasonable interpretation consistent with the specification," citing *In re Hyatt,* 211 F.3d 1367, 1372 (Fed. Cir. 2000). Page 10, lines 8-16 of the present specification, defines a tree structure as a well-known geometric networking structure which begins at a root or origin and branches outward to terminate at leaf nodes. Each node in the tree structure preferably has three sub-branches (e.g., each secondary base repeater node services the following three picocells, each with a receiving secondary base repeater node for receiving the information signal transmitted across the respective picocell from an originating secondary base repeater node). Depending on the needs of the particular embodiment, the tree structure of the secondary base repeater nodes (and hence, the picocells) within a megacell may be balanced or non-balanced (e.g., may have the same number of sub-branches at each node). The Appellants submit that the Lau patent does not teach, disclose or suggest "configuring the base repeater nodes such that they re-broadcast the information signal in a fan-out tree structure," as is claimed in Claim 39, when Claim 39 is interpreted in a manner consistent with the specification. Thus, the Appellants submit that Claim 39 is patentable over the cited prior art.

Claim 40

Claim 40, dependent upon Claim 39, is patentable by virtue of its dependency.

Claim 41

Claim 41, dependent upon Claim 40, is patentable by virtue of its dependency.

On page 4 of the Office Action, the Examiner rejected Claim 41 stating "Lau et al. teaches the networked field addressable distributed antenna system as set forth in Claim 3, wherein the information signal output end receiver is connected with the information source by a loop back means." The Examiner pointed to FIGs. 5 and 7, col. 5, lines 31-67, and col. 6, lines 1-52 of the Lau patent to support his position. The Appellants disagree with the Examiner's interpretation of the Lau patent.

The Appellants are unclear how the Examiner is interpreting the cited sections of the Lau patent and the cited figures, since the Examiner does not indicate what portion of the Lau patent the Examiner believes to be a "loop back means." The Appellants are unaware of anywhere in the Lau patent the concept of "loop back" is taught, disclosed, or suggested. The cited sections and figures of the Lau patent teach that two-way communications can occur between T/R module 62 and any of the other T/R modules, col. 5, lines 53-55 of the Lau patent. However, two-way communications is not the same thing as "loop back." Appendix B contains a variety of different definitions for loop back that can be found on the Internet. Each definition contains the concept that for loop back, the same signal transmitted gets returned to the original transmitter. This is not the same thing as two-way communication, where one transmitter sends a first signal, and the second transmitter sends a second signal in response to the first signal. An example of two-way communication is a conversation, where one person asks "how are you?" and the other person answers "I'm fine." In a loop back situation, the response to "how are you?" from the first person would be "how are you?" from the second person. Thus the Appellants submit that the Lau patent does not teach, disclose, or suggest "looping back the information signal from the output end to the input end," as is claimed in Claim 41. Therefore, the Appellants submit that Claim 41 is patentable over the cited prior art.

Claims 42-45

Claims 42-45 are patentable at least based on their dependency. Further, on page 5 of the Office Action, the Examiner stated that Claims 42-45 contained allowable subject matter.

CONCLUSION

For the extensive reasons advanced above, the Appellants respectfully contend that each claim is patentable. Therefore, reversal of all rejections and objections is courteously solicited.

To the extent necessary, a petition for an extension of time under 37 CFR 1.136 is hereby made. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the attached credit card form or deposit account no. 50-2691 and please credit any excess fees to such accounts.

Respectfully submitted,

10/28/2005
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Encl: Appendix A – pending Claims
Appendix B – definitions of Loop back

APPENDIX A

CLAIMS

What is claimed is:

1. (Original) A networked and field addressable distributed antenna system comprising a large field megacell coverage area, at least a portion of which is partitioned into a plurality of short range picocells, wherein each of the picocells is serviced by a secondary base repeater node operative to receive an information signal from a neighboring secondary base repeater node or from an originating information signal source, and to receive a command signal including a direction command from an originating base station having a command signal transmitter, and to transmit the information signal in at least one of three directions for receipt by local users or by a neighboring secondary base repeater node positioned along the direction to which the information signal was transmitted, the direction in which the information signal is transmitted being determined by the direction command of the command signal, wherein the secondary base repeater nodes are positioned such that they re-broadcast the information signal to neighboring secondary base repeater nodes in a tree structure.

2. (Original) A networked and field addressable distributed antenna system as set forth in claim 1, wherein the secondary base repeater nodes are positioned such that they re-broadcast the information signal in a fan-out tree structure.

3. (Original) A networked and field addressable distributed antenna system as set forth in claim 2, wherein the megacell has an input end and an output end, and wherein the information signal may be propagated from secondary base repeater node to secondary base repeater node from an information signal source at the input end to an information signal output end receiver at the output end, with the information signal output end receiver configured to receive from a plurality of base repeater nodes at the output end of the megacell.

4. (Original) A networked and field addressable distributed antenna system as set forth in claim 3, wherein at least a portion of the secondary base repeater nodes are further configured to modify the received information signal and to re-transmit the received information signal as a modified information signal.

5. (Original) A networked and field addressable distributed antenna system as set forth in claim 3, wherein the information signal output end receiver is connected with the information source by a loop back means.

6. (Original) A networked and field addressable distributed antenna system as set forth in claim 5, wherein the loop back means is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel.

7. (Original) A networked and field addressable distributed antenna system as set forth in claim 6, wherein at least a portion of the secondary base repeater nodes

are further configured to modify the received information signal and to re-transmit the received information signal as a modified information signal.

8. (Original) A networked and field addressable distributed antenna system as set forth in claim 7, wherein the information signal contains a call setup portion and wherein at least a portion of the secondary base repeater nodes further configured with a means for receiving a call setup request from a local user including an identity of at least one second local user in the megacell, and wherein the networked and field addressable distributed antenna system further comprises a means for mapping the identity of a local user to a picocell within the megacell and providing information for generating a direction command of a command signal such that the direction command causes a call to be established along a predetermined path through the megacell and the loop back means from the local user to the at least one second local user, whereby a user may transmit information to at least one other desired user within the megacell.

9. (Original) A networked and field addressable distributed antenna system as set forth in claim 1, wherein the direction command from the command signal includes a direction command for a plurality of secondary base repeater nodes in order to cause the secondary base repeater nodes to transmit the information signal along a predetermined path through the megacell.

10. (Original) A networked and field addressable distributed antenna system as set forth in claim 1, wherein the secondary base repeater nodes further comprise a command signal receiver for receiving a command signal and an information receiving antenna for receiving the information signal from a neighboring secondary base repeater node or from an originating information signal source, an amplifier for receiving the information signal from the information receiving antenna, operative for amplifying the information signal, and an information signal transmitter for receiving the amplified information signal from the amplifier and operative in response to the command signal to transmit the information signal in a direction to at least one of three picocells for receipt by local users or by the next neighboring secondary base repeater node receiving from each picocell to which the information signal was transmitted, the direction in which the information signal is transmitted being determined by the direction command of the command signal.

11. (Original) A networked and field addressable distributed antenna system as set forth in claim 10, secondary base repeater nodes are positioned only in a desired area of coverage within the megacell such that only specified picocells representing the desired area of coverage within the megacell may receive coverage by the information signal.

12. (Original) A networked and field addressable distributed antenna system as set forth in claim 10, wherein the information signal transmitters of the secondary

base repeater nodes are selected from the group consisting of sector antennas and multi-beam forming antenna arrays.

13. (Original) A networked and field addressable distributed antenna system as set forth in claim 12, wherein the information signal transmitters of the secondary base repeater nodes are operative to transmit in at least one of three approximately 60 degree sectors, with the combined three sectors aligned to transmit over a 180 degree angular coverage region substantially opposite the information receiving antenna of the respective secondary base repeater node.

14. (Original) A networked and field addressable distributed antenna system as set forth in claim 10, wherein each picocell is coincident with a coverage range of the servicing secondary base node, with the coverage range of the associated secondary base node including an edge, and wherein a neighboring secondary base node is positioned within the coverage range of the associated secondary base node and near the edge of the coverage range of the associated secondary base node.

15. (Original) A networked and field addressable distributed antenna system as set forth in claim 14, wherein the information signal transmitters of the secondary base repeater nodes are selected from the group consisting of sector antennas and multi-beam forming antenna arrays.

16. (Original) A networked and field addressable distributed antenna system as set forth in claim 15, wherein the information signal transmitters of the secondary base repeater nodes are operative to transmit in at least one of three approximately 60 degree sectors, with the combined three sectors aligned to transmit over a 180 degree angular coverage region substantially opposite the information receiving antenna of the respective secondary base repeater node.

17. (Original) A networked and field addressable distributed antenna system as set forth in claim 16, secondary base repeater nodes are selectively positioned within the megacell such that specified picocells within the megacell may receive coverage by the information signal.

18. (Original) A networked and field addressable distributed antenna system as set forth in claim 16, wherein the secondary base repeater nodes are positioned such that they communicate in a fan-out tree structure.

19. (Original) A networked and field addressable distributed antenna system as set forth in claim 18, wherein the megacell has an input end and an output end, and wherein the information signal may be propagated from secondary base repeater node to secondary base repeater node from an information signal source at the input end to an information signal output end receiver at the output end, with the information signal output end receiver configured to receive from a plurality of base repeater nodes at the output end of the megacell.

20. (Original) A networked and field addressable distributed antenna system as set forth in claim 19, wherein at least a portion of the secondary base repeater nodes are further configured to modify the received information signal and to re-transmit the received information signal as a modified information signal.

21. (Original) A networked and field addressable distributed antenna system as set forth in claim 19, wherein the information signal output end receiver is connected with the information source by a loop back means.

22. (Original) A networked and field addressable distributed antenna system as set forth in claim 21, wherein the loop back means is selected from the group consisting of a fiber-optic cable, a wire, and a point-to-point wireless channel.

23. (Original) A networked and field addressable distributed antenna system as set forth in claim 22, wherein at least a portion of the secondary base repeater nodes are further configured to modify the received information signal and to re-transmit the received information signal as a modified information signal.

24. (Original) A networked and field addressable distributed antenna system as set forth in claim 23, wherein the information signal contains a call setup portion and wherein at least a portion of the secondary base repeater nodes further configured with a means for receiving a call setup request from a local user including an

identity of at least one second local user in the megacell, and wherein the networked and field addressable distributed antenna system further comprises a means for mapping the identity of a local user to a picocell within the megacell and providing information for generating a direction command of a command signal such that the direction command causes a call to be established along a predetermined path through the megacell and the loop back means from the local user to the at least one second local user, whereby a user may transmit information at least one other desired user within the megacell.

25. (Original) A networked and field addressable distributed antenna system as set forth in claim 24, wherein the information signal uses a broadband, picocell transmission channel and command signal uses a narrowband, megacell distribution channel.

26. (Original) A networked and field addressable distributed antenna system as set forth in claim 25, wherein the loop back means is used diagnostically to ensure correct path setup and to check connection integrity within the megacell.

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system comprising the steps of:

    a. receiving an information signal from an information source at a secondary base repeater node;

b. receiving a command signal including a direction command from a command signal transmitter;

c. determining at least one direction in which to re-transmit the received information signal from the secondary base repeater node;

d. re-transmitting the received information signal in at least one of three directions as determined in the determining step (c) for receipt by local users or by a neighboring secondary base repeater node positioned in the direction to which the information signal was transmitted, whereby the information signal may be re-broadcast through a plurality of secondary base repeater nodes in a tree structure.

39. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 38, further comprising the step of configuring the base repeater nodes such that they re-broadcast the information signal in a fan-out tree structure.

40. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system, as set forth in claim 39, further comprising the step of selectively positioning the base repeater nodes such that only desired picocells within the megacell are capable of receiving the information signal.

41. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 40, wherein the megacell has an input end and an output end, and wherein the method further comprises the step of looping back the information signal from the output end to the input end.

42. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 41, further comprising the step of optionally modifying the received information signal at each secondary base repeater node prior the re-transmitting step (d).

43. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 42, further comprising the step of performing a call setup between users in the megacell.

44. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 43, further comprising the step of using the looping back of the information signal for diagnostically ensuring correct path setup and for checking the path setup connection integrity within the megacell.

45. (Original) A method for distributing information to selective picocells within a megacell by using a networked and field addressable distributed antenna system as set forth in claim 41, further comprising the step of using the looping back of the information signal for diagnostically ensuring correct path setup and for checking the path setup connection integrity within the megacell.

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Web

Definitions of **Loopback** on the Web:

- A diagnostic test that returns the transmitted signal back to the sending device after it has passed through a network or across a particular link. The returned signal can then be compared to the transmitted one. The discrepancy between the two help to trace the fault. When trying to locate a faulty piece of equipment, loopbacks will be repeated, eliminating satisfactory machines until the problem is found.
  www.wtcs.org/snmp4tpc/jton.htm

- A method of checking the accuracy of data transmission in which the transmitted data stream is returned, or looped back, to its source for comparison with the original data. Loopbacks can be performed on data in an analog or digital state.
  www.cxrlarus.com/assets/glossary.html

- Directing signals back toward the transmitting terminal at some point along the communications path. Used as a method of troubleshooting.
  www.flw.com/define_l.htm

- A video connection that feeds all or some of the components of a video call back to the codec which made the call. A full network loopback will give a user a delayed feed of his/her video and audio.The delay is approximately 1/4 of a second, giving the effect of an echo on both video and audio. Full network loopbacks are a good way to test the integrity of your site's connection to the IVN. ...
  www.state.il.us/cms/ivn/Training/Glossary.htm

- A diagnostic test or test state in which the transmitted signal is returned to the sending device after passing through a communications link or network.
  www.region-s.de/technik/glossary.htm

- A loopback is a communications channel with only one endpoint. Any message transmitted through such a channel is immediately received by the selfsame channel.
  en.wikipedia.org/wiki/Loopback

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